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The Lowell Textile School

Lowell, Mass.

Programme
Session of 1897

Collected set,

BY TRANSFER
JUN 3 1910

LOWELL TEXTILE SCHOOL

LOWELL, MASS.

Programme for the Half Session of 1897.

One Term.

PARKER BLOCK,

MIDDLE AND MERRIMACK STREETS.

Principal Entrance:

MASONIC BUILDING, NO. 128 MERRIMACK STREET.

TS 1471
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TRUSTEES OF THE LOWELL TEXTILE SCHOOL
(INCORPORATED.)

Officers 1896-97.

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JAMES T. SMITH, CLERK.

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A. K. WHITCOMB, Supt. of Schools, Lowell.

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C. P. BROOKS, Director of the School.

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The Lowell Textile School.

The establishing of a school at Lowell for thorough instruction in the theory and practical art of manufacturing all fibres known to the textile industry, although proposed early in 1891, was not determined upon until the organization, methods and scope of such foreign schools, especially in England, France, Switzerland, Germany and Russia, had been carefully studied, and their permanence and importance to the textile interests of those countries made clearly apparent.

The success attending the Textile School which is developing at Philadelphia, and the benefits derived by the industry from the Lowell School of Applied Design, established and maintained at Boston by Augustus Lowell, Esq., who is one of the representatives of the State of Massachusetts in our corporation, left no room for doubt that American conditions were favorable to the establishment of, in fact imperatively demanded, a textile school here.

The "Trustees of the Lowell Textile School" are incorporated under a special act of the Massachusetts legislature, "for the purpose of establishing and maintaining a Textile School for instruction in the theory and practical art of textile and kindred branches of industry."

The incorporators, with but two exceptions, are gentlemen repre-

senting either as president, director, treasurer, agent or superintendent, the management of great textile corporations of Lowell, Lawrence and vicinity in the Merrimack valley, with an aggregate capital of over $25,000,000. By the terms of the By-laws, at least three-fourths of the Trustees must be "persons actually engaged in or connected with textile or kindred manufactures." This insures the practical character of the management and instruction.

The school is located at Lowell, Massachusetts, the "Mother Textile City of America," the city and state affording financial aid in its establishment, and the manufacturers of New England being equally liberal in their contributions. The advantages of the location of the school at a textile centre where every commercial fibre enters into the products, the student thus being directly in touch with the industry and the management thereof, will be apparent.

The Trustees have been fortunate in obtaining the services of Christopher P. Brooks as Director of the School, a gentleman of large experience as an instructor and examiner of English schools and in the equipping of foreign and American mills.

The Work of the School. The object of the school is to give instruction in the practical knowledge necessary in the cotton, woolen, worsted and other textile industries, in sciences and art as applied to these industries, and in the processes and methods for the purpose of improving any special trade, or of introducing new branches of industry. It is essentially a trade school, and the whole plan provides for such instruction only as will be found useful in textile trades.

Science and art will be taught, but not with the object of educating professional and scientific men, but with a view to industrial and commercial applications ; but the school offers to graduates of universities and scientific institutions an opportunity of technical instruction in the practical application of certain branches of science.

The equipment of the school consists of high grade machinery with all latest improvements, specially built to afford facilities for all kinds of experimental work, and of such variety as is seldom found in any one textile mill. When all the machinery that is already arranged for is installed, the school will have a more extensive equipment of machinery and plant than any other existing textile school either in America, Europe or Asia.

The staff of lecturers and instructors will consist of men who in

addition to their special experience in textile school work have been for years practically engaged in mill work as manager, designer, or in other capacities, and it is the object of the trustees to give technical instruction that shall be equal to that of the best European schools. and at the same time of a thoroughly practical nature.

The operation of the school will be in three directions :—

First, Day Classes. These are especially intended for the instruction of young men whose intention it is to enter the business of textile manufacturing in any branch, and who have not been engaged in a textile trade, or who have already been engaged in such business and wish to improve their knowledge and opportunities, and who are able to devote their entire time to study. The complete collection of machinery enables every process to be practically illustrated. Certain of the evening classes will be considered as part of the course of the day students, especially in subjects for which facilities do not exist for day instruction.

The course is intended to extend over three years, and the instruction given this term will be preliminary to further instruction in two succeeding winters. It is optional whether a student attends the full course of three years, but this is strongly recommended.

The second branch of the school work is intended to give thorough evening instruction to those who are engaged during the day in mills and work shops in the Merrimack valley, to enable those who

wish it to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they are engaged in the day time, and, in the course of several winters, a thorough technical education at a low cost, and without interfering with their daily labor.

The third means of encouraging textile instruction will be by a course of popular lectures, of which details are given on page 31. These lectures will be given by recognized authorities in the branches of which they treat, and afford an opportunity to the students in the school, and inhabitants of Lowell and district, who do not care to take a regular course, to attend popular illustrated textile lectures. Students who are able are recommended to take a day or evening course in addition to attending the above lectures.

Lecturers and Instructors. An able staff of experienced lecturers and instructors will, with Professor C. P. Brooks as principal lecturer, capably represent each department of textiles.

Buildings and Equipment. The school building is capacious and well equipped with elevators, electric light and steam heat, and while arranged especially for school purposes, yet maintains many features of a textile mill in being of mill construction throughout, and having the sprinklers, electric motors, shafting and belting, electric and gas lighting, humidifiers, all installed in the most approved manner, and in some instances having each room equipped differently to give students an opportunity of comparing different systems.

The equipment of machinery is arranged so as to be the most complete of its kind in the world for textile educational purposes, the machinery and plant already arranged for is of a value of $50,000, and is such as will enable raw cotton or wool to be treated in the school at every process until it becomes a woven fabric. The fact that there has been, or will be in the near future, placed in the school machinery from the shops of the following firms is satisfactory proof of its excellence:

The Lowell Machine Shop, of Lowell, Mass.
The Whitin Machine Co., of Whitinsville, Mass.
The Mason Machine Works, of Taunton, Mass.
The Crompton Loom Works, of Worcester, Mass.

The Atwood Machine Co., Stonington, Conn.
Davis & Furber Machine Co., North Andover, Mass.
Torrance Mfg. Co., Harrison, N.J.
G. S. Harwood & Sons, Boston, Mass.
The Knowles Loom Works, of Worcester, Mass.
The Kitson Machine Co., of Lowell, Mass.
George Draper & Sons, of Hopedale, Mass.
T. C. Entwistle, of Lowell, Mass.

Other leading makers of high grade machinery will also be fully represented.

Fees. The fee for the day classes is $50.00 for the term (from February to June, 1897), and there are no other charges, excepting that students must provide their own books, stationery and tools, and pay for any breakage or damage that they cause.

The above fee also includes attendance at certain evening classes, which form part of the day students' course, and also, by permission of the director of the school, free admission to any evening classes in which there is accommodation, and which the day student desires to attend.

In the evening school students may take up any subject, or group of subjects, at fees from fifty cents to $5.00, details of which will be found on pages 27 to 30.

The evening school fees include the privileges of using the library and reading-room, and of attending certain extra lectures free of

charge, and there is no further payment to be made beyond the specified fees, excepting that students have to provide their own books, stationery and tools, and pay for breakages.

The fees in the evening classes are nominal, and are intended to defray little more than cost of material used by the students.

The fees are strictly payable in advance, and are in no case returnable except by vote of the trustees.

Entrance Examinations and Eligibility of Students.

Applications will not be considered if candidates are under fourteen years of age, but students may be of either sex and of any nationality. Those who have completed an ordinary grammar school course or high school course, and possess certificates to that effect, will be received in the school as students without examination, but all others will be expected to sit at an entrance examination, the date of which will be announced later. To pass this examination candidates for either day or evening classes will be required to possess a knowledge of English composition and arithmetic, including fractions. A good elementary education, combined with a knowledge of drawing, either freehand or mechanical, is of great assistance, and in the case of would-be evening students in the Textile school, it will be advisable in some cases to attend a year at the Lowell Evening High school and Drawing school prior to entering the Evening Textile school. The ultimate success in the latter school will probably be greater than if the student enters without such instruction.

The Director will be pleased to advise candidates as to the best course to take, and to give an opportunity for consultation on this and other points will be present at the school on Thursday and Friday, January 21 and 22, from 2 to 5 and 7 to 9 P. M.

Day students who are deficient in knowledge of drawing, may study same in the evening, as explained on page 26.

Examinations. Test examinations will be held at mid-term, and a final examination at the end of the session. The results of the final examination will be considered in the grading of the student at the end of his three years' course in the school.

Students from a distance, requiring rooms and board in the city, may if they desire it, select same from a list of houses which is kept at the school. These houses have been visited and approved by the Director, or other representative of the school. The cost of rooms and board in a good district is from $4 per week upwards.

Conduct. Day students will be expected to attend all lectures, classes and demonstrations of practical work, except when permission to be absent has been obtained from the Director. In case of sickness, or other unavoidable absence, written explanation must be sent. When specially required by parents, cases of absence will be reported daily.

Books will be prescribed for entry of lecture notes and other exercises, and will be periodically examined by the lecturers. Day

students will be expected to spend two hours daily out of school hours, in home study and entering up notes and exercises. The care and accuracy with which these books are kept will be considered in the final examinations.

In the case of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly conduct, or profane or indecent language, will be considered good and sufficient reasons for the removal of a student from the school, and for the forfeiture of all school privileges, if the President of the school so decides.

Library. The school library is supplied with all the leading textile books and with works dealing with sciences, art, or industries allied to the textile trades. The leading textile trade papers, both European and American, will be obtained. The library will be open to duly qualified students of the school throughout the day and evening.

Length of Session. The first session of the day school will consist of one term only, from February 1st, 1897, to June 3d, 1897. In the succeeding years, it is intended to have a session from October to June, divided into two terms.

A schedule will be prepared showing how the school hours will be divided and the amount of time to be devoted to each subject.

The students will be required to attend at such hours as the Director shall, from time to time determine, and prepare such home exercises as are required by the Lecturer or Instructor in each department.

The register will be marked at the beginning of each lecture or demonstration and reports made periodically of students' attendance.

The above applies to the day classes only.

The evening classes will be held from February 8th to April 30th, and at the hours named on pages 27 to 30.

The school will be closed on Washington's Birthday, February 22d, two or three days in April, and on Decoration Day, May 30th.

General. All raw stock and yarn will be provided by the school and all the productions of the school remain, or become, the property of the Trustees, except by special arrangement, but each student will be allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated as prescribed by the Director, and facilities will be given for the preparation of collection of such fabrics as are produced in the school, with all instructions for their manufacture. It is understood that the Trustees may retain in the school such other specimens of student's work as the Director may determine.

Lock boxes will be provided, free of charge, for the use of the students, sufficiently capacious to contain clothing, books and tools.

No books, instruments, or other property of the school, will be loaned to students, or allowed to be removed from the premises.

Facilities will be given for visits by day students to New England mills and works during the session.

Text books will be recommended by the teachers, and students are expected to purchase these, and also such tools and instruments as may from time to time be required for their own use. The cost of these, for day students, will be from $10.00 to $15.00, and for evening students, from $2.00 upwards, according to the subjects studied.

Instruction.

First Year Course. Day Classes.

The following is the course of instruction that will be followed in the first session.

1. Course of lectures on Cotton, Cotton Spinning, Machinery and Process. Subjects :

The structure of the cotton fibre.

Varieties of cotton produced in various parts of the world, and leading characteristics of same.

The selection of cotton, testing raw cotton.

Hand and mechanical methods of mixing and distributing cotton from the bale.

The construction of openers and automatic feeders.

The construction of breaker lappers.

The construction of finisher lappers.

The operation and care of picking machinery.

Theory of carding and development of carding machinery.

The stationary top card.

The roller and clearer card.

The revolving top card.

Card grinding, setting, stripping, and care of cards.

Construction and use of the railway head.

Principle of drawing, processes.

Construction and care of the drawing frame.

2. Practical work on machines named in above lectures timed to correspond with lecture course.

3. Course of lectures on Weaving Machinery and Processes, as used for cotton, woolen and worsted, including warp preparation. Subjects :

Varieties and forms of yarn as used for weaving.

The construction and use of spooling machinery.

The construction and use of warpers of various kinds.

The slasher, its construction and use.

Sizing materials and size mixing machinery.

Other systems of warp preparation for special purposes.

Drawing-in and twisting.

The hand loom and the development of the power loom.

The plain power loom and its construction.

Shedding by tappets.

Various picking motions.

Fast and loose reeds, take-up and let-off motions.

Minor attachments to the plain loom.

Looms constructed for several shuttles.

Drop box motions.

Circular box motions.

Timing, setting and fixing one part in relation to another.

4. Practical Work on Spoolers, Warpers, Slashers, Dressers and Power Looms, cotton, woolen and worsted, timed to correspond with the respective lectures.

5. Lessons on Calculations for Cotton Spinning Machinery and Processes, and Weaving Machinery. Subjects:

Speeds of shafts in motion.
Alterations to speeds of shafts and parts of machines.
Principle of numbering yarn and tables for same.
Numbers, or hanks, of laps, slivers, bobbins, or yarn.
Number of total doublings and drafts.
Percentage of loss in weight of stock at various processes.
Speeds and drafts on picker machinery.
Speeds and drafts on the card, length of fillet required.
Alterations to weight of sliver.
Comber, derby doubler and sliver lap machine calculations.
Drafts and speeds of slubber and spooler.
Changes of twist and other gears, constant numbers, turns per inch.
Similar calculations for mule and ring spinning.
Arranging mill machinery, in relation to production, suitable drafts and weights of stock.
Cost of production and other mill statistics.
Doubling calculations, numbers of folded or ply yarn.
Calculations on the make-up of yarns in warps or skeins.
Speeds and changes on warpers, spoolers and looms.
Take-up calculations for looms.
Size of shed and size of tappet on looms.

6. Course of lessons on Weaving Calculations and Fabric Calculations. Subjects:

The uses of textile calculations, methods of naming or counting cotton, worsted and linen.

Methods of naming woolen yarns.

Methods of naming silk yarns.

Comparative calculations for converting one system into that of another.

Calculations for folded or ply yarns.

Calculations for the cost of folded or ply yarns, and quantities of each required to produce a given weight.

Calculations to find weight, count or length of warp, from given data.

Calculations for reeds.

Calculations for harness, straight, centred, or pointed draft.

Calculations for harness, spaced and in combinations.

Calculations for shrinkage, or contraction.

Calculations for the quantities of material required to make plain and striped warps.

Calculations for the quantities of weft required to make plain and checked fabrics.

Calculations to find the number of ends per inch in order to use a given weight of warp, also picks per inch to use a given weight of weft.

Winding, warping, slashing, drawing-in and twisting.

Cost of grey cloth.

Cost of colored cloth.

Calculations on the proportioning of fabrics.

Methods of determining the extent of adulterations found in yarn and cloth.

Testing the warp and filling in a fabric to ascertain the counts.

Analysis of fabrics for ends, picks, counts of warp and filling, with the quantities of each required, and other necessary particulars for the reproduction of cloth.

7. Course of lectures on cloth construction and designing in Cotton, Woolen and Worsted. Subjects:

Classifications of fabrics.

Plain fabrics and fabrics on a plain cloth basis.

Names and explanation of different parts of cloth and terms applied to weaves, etc. Point or design paper.

Methods of representing weaves, drafts, etc., on paper.

Explanation of harness and chain drafts.

Twill cloth and combinations of same.

Broken twills.

Sateens.

Combination of weaves.

Figured weaving in general.

Diapers, toweling, velveteens, coatings, trouserings, and goods made on tappet looms.

Colored goods, stripes.

Checked goods.

Cloth made with, or ornamented by, extra warp.

Cloth ornamented by extra filling.

8. Practical Work and teaching on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, etc., on paper.

9. Practical Work on hand looms, putting into operation the principles taught in the foregoing course.

10. Lectures on color in textiles and applied art. Subjects:

Color in relation to textiles.

Harmony of color.

Contrast of color.

Principles of coloring and shading.

Color as applied to stripes and checks.

Color as applied to floral and geometrical designs, and a continuation of this according to progress made by students.

Science. 11. Applied mechanics.

General. Additional courses of lectures will probably be arranged for and delivered in the evening on processes connected with textiles, such as dyeing, bleaching, printing and finishing and on mill engineering. These will be considered as part of the regular course, and students will attend same.

Arrangements will also be made for students to have instruction two evenings per week in drawing. Freehand drawing for those intending to become designers, and mechanical drawing for those who intend to follow other branches of textile manufacturing.

First Year Course. Evening Classes. The plan of evening instruction includes all the subjects taught in the day classes, with several additional ones, but as the time at the disposal of those who work in the mill is limited, there is no necessity or even possibility of taking all the subjects in one session. Certain groupings of subjects have been arranged, and it is strongly recommended that those who have the time to devote take up a group and not a single subject. The fees charged for each subject include the whole course in that subject, and are arranged so low in most cases as to merely cover cost of material used.

Spinning. 1. Course of lectures on Cotton, Cotton Spinning, Machinery and Processes.

For lists of subjects see page 21.

Fee for this subject $1.00.

Wednesday evenings. Seven o'clock till eight o'clock.

2. Practical work on machines named in above lectures, timed to correspond with lecture course.

Fee for this subject, together with No. 1, $2.00.

Friday evenings. Seven o'clock till nine o'clock.

3. Lessons on Calculations for Cotton Spinning Machinery and Processes.

For lists of subjects, see page 23.

Fee for this subject, $1.00.

Wednesday evenings. Eight o'clock till nine o'clock.

The above three form the Cotton Spinning group, for which the total fee is $2.50.

Weaving.

4. Course of lectures on Weaving Machinery and Processes, as used for cotton, woolen and worsted, including warp preparation.

For subject of lectures, see page 22.

The fee for this subject is $1.00.

Monday evenings. Seven o'clock till eight o'clock.

5. Practical work on spoolers, warpers, slashers, dressers, and power looms, cotton, woolen and worsted, timed to correspond with the respective lectures.

The fee for this subject, together with No. 4, is $2.00.

Tuesday evenings. Seven o'clock till nine o'clock.

6. Lessons on Calculations connected with Machinery.

The fee for this subject is $1.00.

Wednesday evenings. Eight o'clock till nine o'clock.

The above forms the Weaving group, for which the total fee is $2.50.

Designing. 7. Course of lectures on cloth construction and designing in both Cotton, Woolen and Worsted.

For list of subjects, see page 25.

Tuesday evenings. Seven o'clock till nine o'clock.

8. Practical work and teaching on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, etc. on paper.

Wednesday evenings. Seven o'clock till nine o'clock.

Subjects Nos. 7 and 8 may be taken together, and the fee for same is $3.00.

9. Course of lessons on Weaving Calculations and Fabric Calculations.

For list of subjects, see page 23.

Fee for this subject is $1.00.

Monday evenings. Seven o'clock till eight o'clock.

10. Practical Work on hand looms, putting into operation the principles taught in the foregoing courses.

Fee for this course is $3.00.

Friday evenings. Seven o'clock till nine o'clock.

11. Lectures on color in textiles and applied art.

For list of subjects, see page 26.

Monday evenings. Eight o'clock till nine o'clock.

Fee for this subject is $1.00, and combined fee for the whole design course is $5.00, payable in advance.

Science.

12. Course of teaching in applied mechanics.
Fee for this subject is $1.00.
Monday evenings. Eight o'clock.

General.

It is proposed to organize several other courses of lectures, including processes connected with the textile industries, such as cotton dyeing, bleaching and finishing, woolen dyeing, woolen and worsted cloth finishing, hosiery manufacture, steam and water power and transmission of power.

The fee for such of these as can be arranged, will be fifty cents the course, but recognized day and evening students, taking at least two other subjects, will be admitted to special lectures free, and will also be admitted to the popular lectures free, providing that their dues are all paid.

Free Popular Lectures.

Free popular lectures have been arranged for and will be delivered in the Lecture Hall of the School at intervals. Among the lectures already decided on are : — An opening address.

INDUSTRIAL EDUCATION.

By S. N. D. North, Esq., Secretary of the National Association of Wool Manufacturers.

LECTURE ON TEXTILE FIBRES.

By Hy. G. Kittredge, Esq., Editor Industrial Record.

LECTURE ON WOOL AND THE WOOL FIBRE.

By W. D. Hartshorne, Esq., Superintendent of the Arlington Mills, Lawrence, and addresses from other gentlemen.

Admission will be free, by tickets to be obtained on application at the school.

Note to Second Edition.

Since the first edition of this programme was printed Mr. Fenwick Umpleby, of Gilbertville, Mass., has been appointed assistant instructor and Mr. Samuel Holt a weaving instructor.

BUTTERFIELD PRINTING & BINDING CO., LOWELL, MASS.

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